Lucerne Farms
Aroostook County
Fort Fairfield, Maine
A-445-71-G-R/A (SM)

Departmental
Findings of Fact and Order
Air Emission License

After review of the air emissions license application, staff investigation reports and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 M.R.S.A., Section 344 and Section 590, the Department finds the following facts:

I. REGISTRATION

A. Introduction

Lucerne Farms of Fort Fairfield, Maine has applied to renew their Air Emission License permitting the operation of emission sources associated with their crop drying equipment.

B. Emission Equipment

The following equipment is addressed in this air emission license:

Fuel Burning Equipment

Equipment	Maximum Capacity (MMBtu/hr)	Maximum Firing Rate	Fuel Type, % sulfur	Post Combustion Control	Stack
Burner 1	20	2615 lb/hr*	Wood	Cyclones	Dryer stack**
Burner 2	13	92.9 gal/hr	#2, 0.35%	Cyclones	Dryer stack

* Based on wood at 15% moisture with a heating value of 7,650 Btu/lb.

** Under normal circumstances, Burners #1 and #2 vent through the rotary dryer and a common stack, but the wood burner (Burner #1) has a bypass stack used during start up.

Note: The product conveyor line coming out of the dryer has a cyclone which exhausts product into the storage building and transfers air to a stack next to the building.

C. Application Classification

The application for Lucerne Farms does not include the licensing of new or modified equipment. AP-42 emission limits for wood-fired burners and alfalfa drying have been revised, and the limits in this license have been updated to reflect this revision and corrected for rounding. Additionally, the efficiencies of the cyclones have been modified to more closely reflect actual operation. This has caused an increase in the licensed potential to emit, although the process has

not changed. Therefore, the license is considered to be a renewal of current licensed emission units plus an amendment for the increase in licensed emissions.

II. BEST PRACTICAL TREATMENT (BPT)

A. Introduction

In order to receive a license the applicant must control emissions from each unit to a level considered by the Department to represent Best Practical Treatment (BPT), as defined in Chapter 100 of the Department regulations. Separate control requirement categories exist for new and existing equipment as well as for those sources located in designated non-attainment areas.

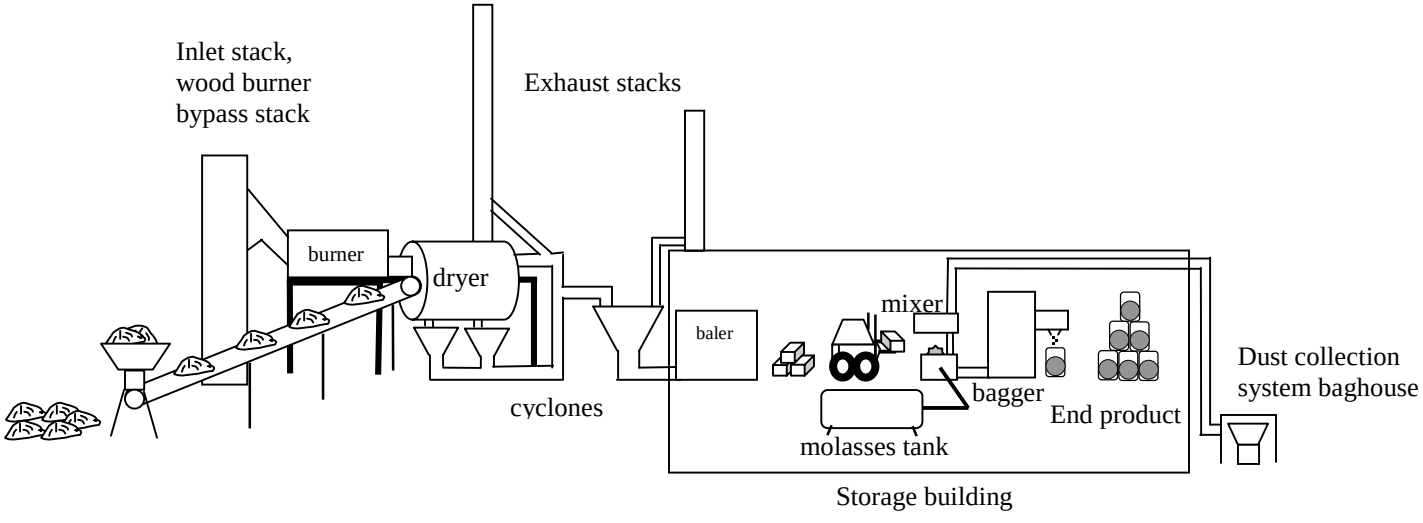
BPT for existing emissions equipment means that method which controls or reduces emissions to the lowest possible level considering:

- the existing state of technology;
- the effectiveness of available alternatives for reducing emissions from the source being considered; and
- the economic feasibility for the type of establishment involved.

Before proceeding with the control requirements for each unit a general process description is provided to identify where the equipment fits into the process.

Process Description

Lucerne Farms produces specialty horse feeds. Alfalfa, timothy hay, oat hay and straw are chopped into small pieces and then dried to a moisture content of about 50%. The hay products are fed into the rotary crop dryer for further drying. The dryer is capable of firing wood in Burner #1 and fuel oil in Burner #2. The dryer capacity prevents the burners from firing at the same time. Lucerne Farms primarily utilizes the wood burner. As the drum rotates, particulate matter and dust separate from the material inside and are collected by two cyclones. The dried hay, now with a moisture content of approximately 10%, exits the dryer and a third cyclone filters small particles from the product conveyor line. The particles removed by the three cyclones are reintroduced to the dried product at the baler. Baled hay is then stored for mixing.



Several varieties of horse feed are created by mixing the different types of hay in particular quantities and adding molasses. Fork trucks deliver the appropriate ratios of crop types to a rotating mixer. The addition of the molasses helps the mixture stick together and prevents dust. A hood over the mixer collects dust that is produced and this inside air exhausts through a baghouse outside. From the mixer the product is bagged and stored for sale.

B. Dryer Particulate Emissions

The drying crops produce particulate matter (PM) emissions. Emissions from the dryer are conservatively assumed to consist solely of PM_{10}. Lucerne Farms uses a settling tank for pretreatment prior to the cyclones. A previous BPT analysis established appropriate emission factors used to determine the PM emissions. Alfalfa is used as a basis to determine representative emission factors as shown in the calculations below.

$$\frac{4.7\,tons\,wet\,alfalfa}{hour}\times\frac{2000\,lb}{ton}\times 0.80\,dry\,weight=\frac{7250\,lb\,dry\,alfalfa}{hour}$$

Assuming the settling tank removes 95% of the alfalfa (based on operational experience), then the PM load to the cyclones is:

$$\frac{7250\,lb\,dry\,alfalfa}{hour}\times(1-0.95)=\frac{376\,lb\,dry\,alfalfa}{hour}$$

Lucerne Farms uses two cyclones in series following the settling tank. EPA documentation estimates the average efficiency of conventional single cyclones for PM_{10} removal at 60%. Two cyclones in series would then have an 84% removal efficiency.

$$\frac{376\,lb\,dry\,alfalfa}{hour}\times(1-0.84)=\frac{60.16\,lb\,dry\,alfalfa}{hour}$$

This emission rate is more stringent than the limit from Chapter 105 of the Department's regulations (General Process Source Particulate Emission Standard), using 4.7 tons/hour as the process weight rate.

EPA conducted testing on alfalfa dehydrating and found VOC emissions from single-pass dryer cyclones to be at non-detect levels within the accuracy of the testing equipment (AP-42 9.9.4 Alfalfa Dehydrating, 9/96).

Visible emissions from each of the two dryer cyclones shall not exceed 20% opacity based on a 6-minute block average basis, except for no more than one 6-minute block average in a 1-hour period.

C. Burner #1

Burner #1 is a wood burner rated at 20 MMBtu/hr. The burner vents through the dryer and exhausts to the settling chamber and through two cyclones. Wood fuel use shall not exceed 2500 tons/year at 15% moisture or equivalent, based on a 12-month rolling total.

A summary of the BPT analysis for Burner #1 is the following:

1. Total fuel use for the facility shall not exceed 2,500 tons/year of wood at 15% moisture or equivalent, on a 12-month rolling total.
2. Chapter 103 regulates PM emission limits on a lb/MMBtu basis. The PM_{10} limits and the lb/hour limits are derived from the PM limits.
3. SO_2, NOx and VOC emission limits are based upon AP-42 data dated 9/98.
4. CO emission limits are based on manufacturer's data.
5. When the wood burner is firing, visible emissions from the burner exhaust stack shall not exceed 30% opacity on a 6-minute block average basis, except for no more than two 6-minute block averages in a 3-hour period.

D. Burner #2

Burner #2 is an oil burner rated at 13 MMBtu/hr. The burner vents through the dryer and exhausts to the settling chamber and through two cyclones. Fuel use for Burner #2 shall not exceed 25,000 gallons/year of #2 fuel oil on a 12-month rolling total and with a maximum sulfur content not to exceed 0.35% by weight.

A summary of the BPT analysis for Burner #1 is the following:

1. Total fuel use for the facility shall not exceed 25,000 gallons/year of #2 fuel oil on a 12-month rolling total and with a maximum sulfur content not to exceed 0.35% by weight.
2. Chapter 103 regulates PM emission limits on a lb/MMBtu basis. The PM_{10} limits and the lb/hour limits are derived from the PM limits.
3. SO_2, NOx and VOC emission limits are based upon AP-42 data dated 9/98.
4. CO emission limits are based on manufacturer's data.
5. When the oil burner is firing, visible emissions from the burner exhaust stack shall not exceed 20% opacity on a 6-minute block average basis, except for no more than one 6-minute block average in a 3-hour period.

E. Material Handling

The dried crops are conveyed to the storage building after leaving the dryer. A cyclone removes fines from the conveyor line and exhausts the process air. Visible emissions from this process cyclone's stack shall not exceed 20% opacity on a 6-minute block average, except for no more than one 6-minute block average in a 1-hour period.

F. Dust Collection System

The dust collection system pulls dust into a hood over the mixer and exhausts it through a baghouse outside the storage building. Visible emissions from the baghouse shall not exceed 10% opacity on a 6-minute block average basis, except for no more than one 6-minute block average in a 1-hour period. Lucerne Farms shall take corrective action if visible emissions from the baghouse exceed 5% opacity.

G. General Process Sources

Prior to drying, the crop products are chopped into small pieces. Process emissions from the hay chopping operation may be vented outdoors. Visible emissions from the hay chopping operations shall not exceed 20% opacity on a 6-minute block average basis, except for no more than one 6-minute block average in a 1-hour period.

H. Fugitive Emissions

Visible emissions from a fugitive emission source (including stockpiles and roadways) shall not exceed 20% opacity, except for no more than 5-minutes in any 1-hour period. Compliance shall be determined by an aggregate of the individual 15-second opacity observations that exceed 20% in any one hour.

I. Annual Emissions

The annual emissions were calculated based on the following:

1. 2,500 tons of wood fired in Burner #1.
2. 25,000 gallons of #2 fuel oil with a maximum sulfur content not to exceed 0.35% by weight fired in Burner #2.
3. The crop dryer operated at maximum capacity for every hour Burner #1 and Burner #2 are in operation.

Lucerne Farms shall be restricted to the following annual emissions, based on a 12 month rolling total:

Total Licensed Annual Emission for the Facility
Tons/year
(used to calculate the annual license fee)

	PM	**PM_{10}**	**SO_2**	**NOx**	**CO**	**VOC**
Wood burner	5.74	5.74	0.48	9.37	3.83	0.25
Oil burner	0.35	0.35	0.62	0.7	0.07	0.01
Crop Dryer	65.7	65.7	--	--	--	--
Total TPY	**71.79**	**71.79**	**1.10**	**10.07**	**3.90**	**0.26**

III. AMBIENT AIR QUALITY ANALYSIS

According to the Maine Regulations Chapter 115, the level of air quality analyses required for a renewal source shall be determined on a case-by case basis. Based on the above total facility emissions, Lucerne Farms is below the emissions level required for modeling and monitoring.

ORDER

Based on the above Findings and subject to conditions listed below, the Department concludes that the emissions from this source:

- will receive Best Practical Treatment,
- will not violate applicable emission standards,
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants Air Emission License A-445-71-G-R/A subject to the following conditions:

STANDARD CONDITIONS

(1) Employees and authorized representatives of the Department shall be allowed access to the licensee's premises during business hours, or any time during which any emissions units are in operation, and at such other times as the Department deems necessary for the purpose of performing tests, collecting samples, conducting inspections, or examining and copying records relating to emissions (Title 38 MRSA §347-C).

(2) The licensee shall acquire a new or amended air emission license prior to commencing construction of a modification, unless specifically provided for in Chapter 115. [MEDEP Chapter 115]

(3) Approval to construct shall become invalid if the source has not commenced construction within eighteen (18) months after receipt of such approval or if construction is discontinued for a period of eighteen (18) months or more. The Department may extend this time period upon a satisfactory showing that an extension is justified, but may condition such extension upon a review of either the control technology analysis or the ambient air quality standards analysis, or both. [MEDEP Chapter 115]

(4) The licensee shall establish and maintain a continuing program of best management practices for suppression of fugitive particulate matter during any period of construction, reconstruction, or operation which may result in fugitive

dust, and shall submit a description of the program to the Department upon request. [MEDEP Chapter 115]

(5) The licensee shall pay the annual air emission license fee to the Department, calculated pursuant to Title 38 M.R.S.A. §353. [MEDEP Chapter 115]

(6) The license does not convey any property rights of any sort, or any exclusive privilege. [MEDEP Chapter 115]

(7) The licensee shall maintain and operate all emission units and air pollution systems required by the air emission license in a manner consistent with good air pollution control practice for minimizing emissions. [MEDEP Chapter 115]

(8) The licensee shall maintain sufficient records to accurately document compliance with emission standards and license conditions and shall maintain such records for a minimum of six (6) years. The records shall be submitted to the Department upon written request. [MEDEP Chapter 115]

(9) The licensee shall comply with all terms and conditions of the air emission license. The filing of an appeal by the licensee, the notification of planned changes or anticipated noncompliance by the licensee, or the filing of an application by the licensee for a renewal of a license or amendment shall not stay any condition of the license. [MEDEP Chapter 115]

(10) The licensee may not use as a defense in an enforcement action that the disruption, cessation, or reduction of licensed operations would have been necessary in order to maintain compliance with the conditions of the air emission license. [MEDEP Chapter 115]

(11) In accordance with the Department's air emission compliance test protocol and 40 CFR Part 60 or other method approved or required by the Department, the licensee shall:

A. perform stack testing to demonstrate compliance with the applicable emission standards under circumstances representative of the facility's normal process and operating conditions:
   1. within sixty (60) calendar days of receipt of a notification to test from the Department or EPA, if visible emissions, equipment operating parameters, staff inspection, air monitoring or other cause indicate to the Department that equipment may be operating out of compliance with emission standards or license conditions; or
   2. pursuant to any other requirement of this license to perform stack testing.

B. install or make provisions to install test ports that meet the criteria of 40 CFR Part 60, Appendix A, and test platforms, if necessary, and other accommodations necessary to allow emission testing; and

C. submit a written report to the Department within thirty (30) days from date of test completion.

[MEDEP Chapter 115]

(12) If the results of a stack test performed under circumstances representative of the facility's normal process and operating conditions indicate emissions in excess of the applicable standards, then:

A. within thirty (30) days following receipt of such test results, the licensee shall re-test the non-complying emission source under circumstances representative of the facility's normal process and operating conditions and in accordance with the Department's air emission compliance test protocol and 40 CFR Part 60 or other method approved or required by the Department; and

B. the days of violation shall be presumed to include the date of stack test and each and every day of operation thereafter until compliance is demonstrated under normal and representative process and operating conditions, except to the extent that the facility can prove to the satisfaction of the Department that there were intervening days during which no violation occurred or that the violation was not continuing in nature; and

C. the licensee may, upon the approval of the Department following the successful demonstration of compliance at alternative load conditions, operate under such alternative load conditions on an interim basis prior to a demonstration of compliance under normal and representative process and operating conditions.

[MEDEP Chapter 115]

(13) Notwithstanding any other provisions in the State Implementation Plan approved by the EPA or Section 114(a) of the CAA, any credible evidence may be used for the purpose of establishing whether a person has violated or is in violation of any statute, regulation, or Part 70 license requirement. [MEDEP Chapter 115]

(14) The licensee shall maintain records of malfunctions, failures, downtime, and any other similar change in operation of air pollution control systems or the emissions unit itself that would affect emission and that is not consistent with the terms and conditions of the air emission license. The licensee shall notify the Department within two (2) days or the next state working day, whichever is later, of such occasions where such changes result in an increase of emissions. The licensee shall report all excess emissions in the units of the applicable emission limitation. [MEDEP Chapter 115]

(15) Upon written request from the Department, the licensee shall establish and maintain such records, make such reports, install, use and maintain such monitoring equipment, sample such emissions (in accordance with such methods, at such locations, at such intervals, and in such a manner as the Department shall

prescribe), and provide other information as the Department may reasonably require to determine the licensee's compliance status. [MEDEP Chapter 115]

SPECIFIC CONDITIONS

(16) **Dryer**

A. Emissions from the dryer when processing alfalfa and other grains shall vent through the settling chamber and two cyclones prior to being exhausted through the stack.

B. Burner #1 shall fire wood. Total fuel use for Burner #1 shall not exceed 2,500 tons/year of wood (15% moisture or equivalent), based on a 12-month rolling total. A fuel log shall be maintained documenting monthly fuel use and the 12-month rolling total.

C. Burner #2 shall fire #2 fuel oil with a maximum sulfur content not to exceed 0.35% by weight. Total fuel use for Burner #2 shall not exceed 25,000 gallons/year, based on a 12-month rolling total. A fuel log shall be maintained documenting monthly fuel use, the 12-month rolling total, and fuel sulfur content (from actual fuel receipts). [MEDEP Chapter 115, BPT]

D. Emissions from the dryer shall not exceed the following [MEDEP Chapter 115, BPT]:

Emission Unit	**PM (lb/hr)**	**PM_{10} (lb/hr)**	**SO_2 (lb/hr)**	**NOx (lb/hr)**	**CO (lb/hr)**	**VOC (lb/hr)**
Burner #1	66.2	66.2	0.5	9.8	4	0.26
Burner #2	62.8	62.8	4.6	5.2	0.47	0.02

E. When the wood burner is firing, visible emissions from the burner exhaust stack shall not exceed 30% opacity on a 6-minute block average basis, except for no more than two 6-minute block averages in a 3-hour period. [MEDEP Chapter 101]

F. When the oil burner is firing, visible emissions from the burner exhaust stack shall not exceed 20% opacity on a 6-minute block average basis, except for no more than one 6-minute block average in a 3-hour period. [MEDEP Chapter 101]

G. Visible emissions from each of the two dryer cyclones shall not exceed 20% opacity based on a 6-minute block average basis, except for no more than one 6-minute block average in a 1-hour period.

(17) **Material Transport System**

A. The material transport system shall vent to a cyclone before entering the storage building.

B. Visible emissions from the material transport system's cyclone stack shall not exceed 20% opacity on a 6-minute block average, except for no more than one 6-minute block average in a 1-hour period. [MEDEP Chapter 101]

(18) **Dust Collection System**

A. The dust collection system shall vent to a baghouse. [MEDEP Chapter 115, BACT]

B. Visible emissions from the baghouse shall not exceed 10% opacity on a 6-minute block average basis, except for no more than one 6-minute block average in a 1-hour period. Lucerne Farms shall take corrective action if visible emissions from the baghouse exceed 5% opacity. [MEDEP Chapter 101]

(19) **General Process Sources**

Visible emissions from any general process source shall not exceed an opacity of 20% on a 6-minute block average basis, except for no more than one 6-minute block average in a 1-hour period. [MEDEP Chapter 101]

(20) **Fugitive Emissions**

Visible emissions from a fugitive emission source (including stockpiles and roadways) shall not exceed an opacity of 20 percent, except for no more than five (5) minutes in any 1-hour period. Compliance shall be determined by an aggregate of the individual fifteen (15)-second opacity observations which exceed 20 percent in any one (1) hour. [MEDEP Chapter 101]

(21) **Malfunctions and Breakdowns**

Lucerne Farms shall notify the Department within 48 hours and submit a report to the Department on a quarterly basis if a malfunction or breakdown in any component causes a violation of any emission standard (Title 38 MRSA §605).

(22) **Annual Emission Statement**

In accordance with MEDEP Chapter 137, the licensee shall annually report to the Department the information necessary to accurately update the State's emission inventory by means of:

1) A computer program and accompanying instructions supplied by the Department;

   or

2) A written emission statement containing the information required in MEDEP Chapter 137.

Reports and questions should be directed to:

Attn: Criteria Emission Inventory Coordinator
Maine DEP
Bureau of Air Quality
17 State House Station
Augusta, ME 04333-0017

Phone: (207) 287-2437

The emission statement must be submitted by September 1 or as otherwise specified in Chapter 137.

(23) **Payment of Annual License Fee**

Lucerne Farms shall pay the annual air emission license fee within 30 days of August 31 of each year. Pursuant to 38 MRSA 353-A, failure to pay this annual fee in the stated timeframe is sufficient grounds for revocation of the license under 38 MRSA 341-D, subsection 3.

DONE AND DATED IN AUGUSTA, MAINE THIS DAY OF 2004.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: _____
DAWN R. GALLAGHER, COMMISSIONER

The term of this license shall be five (5) years from the signature date above.

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: March 17, 2004
Date of application acceptance: April 2, 2004

Date filed with the Board of Environmental Protection: _____

This Order prepared by Rachel E. Pilling, Bureau of Air Quality.